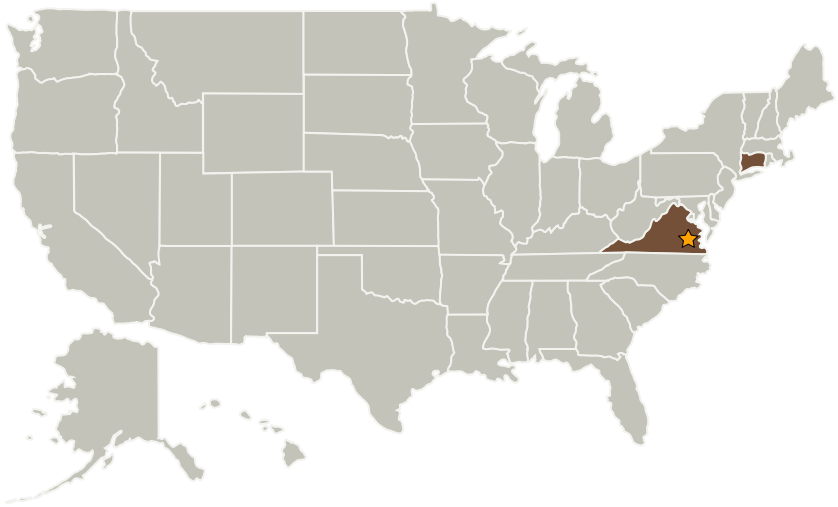
In-Flight Imaging Systems for Hypervelocity and Re-Entry Vehicles, Phase I

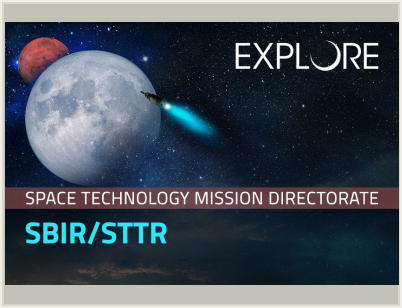
Completed Technology Project (2004 - 2004)

Project Introduction

It is proposed to create a rugged, reliable, compact, standardized imaging system for hypervelocity and re-entry vehicles using sapphire windows, small imagers, and independent telemetry. Such a system is a novel creation that can tolerate the severe aerothermal environment associated with hypervelocity flight. The proposed system answers a critical need for enhanced situation awareness, performance characterization, and rapid anomaly resolution. Images of control surfaces, vehicle health, separation deployment, plume dynamics, combustion behavior, and many other vehicle properties provide a rapid, global assessment of the flows and control status of aerospace vehicles and propulsion systems using a standardized diagnostic package. The system design includes a window, window mounting system, camera, and independent telemetry system. Work in Phase 1 will include computational aerothermal modeling, window, mount, camera, and telemetry design, preliminary hazards analysis, and feasibility/ applications assessment. A Phase 2 prototype will be designed and fabricated for testing at a NASA facility, and finally used on a variety of vehicles in Phase 3. It is expected that the imaging system will have broad application for NASA, DOD, and commercial aerospace vehicles.

Primary U.S. Work Locations and Key Partners





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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Langley Research Center (LaRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
★Langley Research Center(LaRC)	Lead Organization	NASA Center	Hampton, Virginia
Thoughtventions Unlimited	Supporting Organization	Industry	Glastonbury, Connecticut

Primary U.S. Work Locations	
Connecticut	Virginia

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Principal Investigator:

Stephen C Bates

Technology Areas

Primary:

- TX15 Flight Vehicle Systems
  - TX15.1 Aerosciences
    - TX15.1.5 Propulsion Flowpath and Interactions